

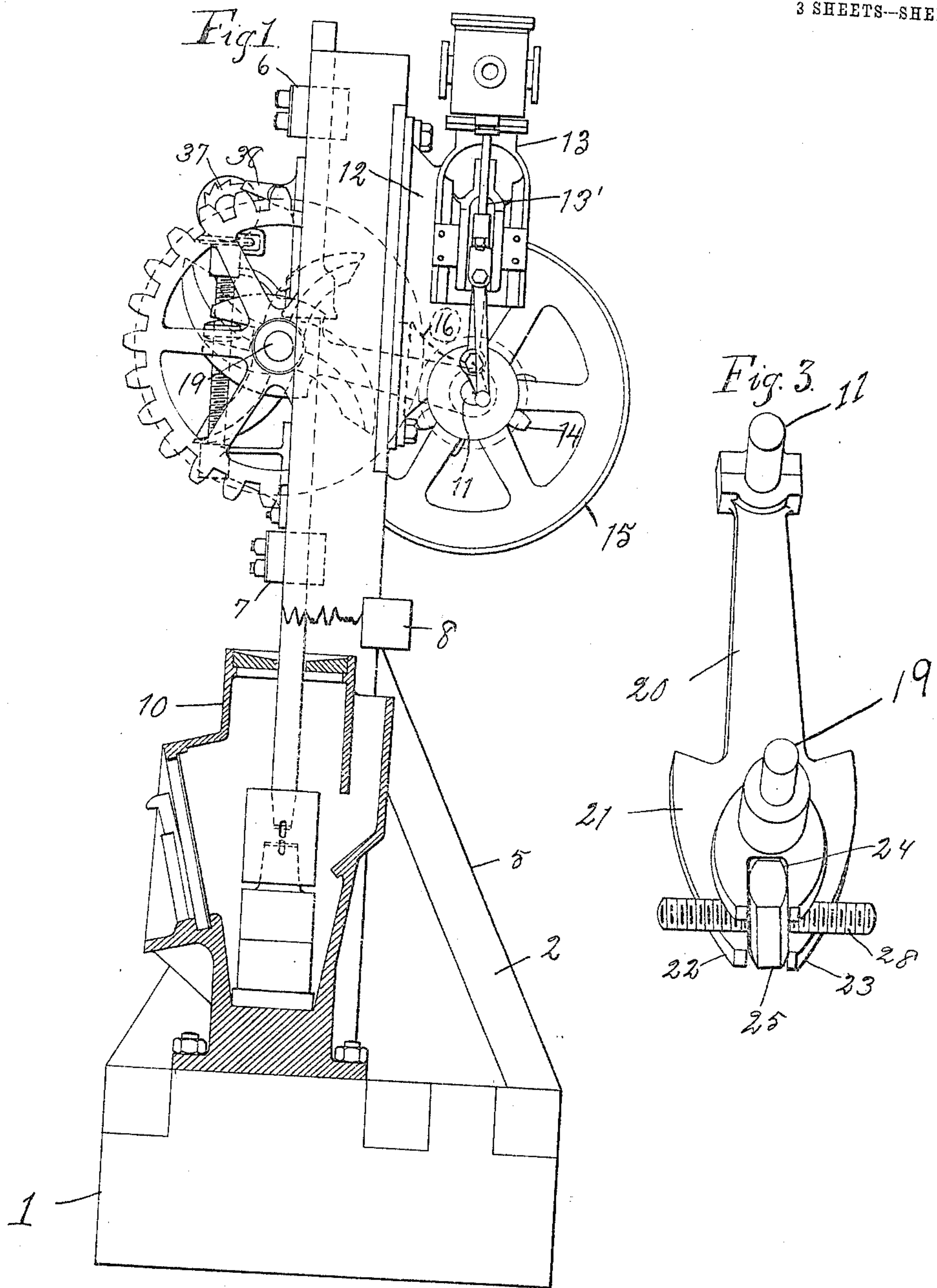
No. 811,079.

PATENTED JAN. 30, 1906.

W. S. McKINNEY.
STAMP ACTUATING MECHANISM FOR ORE CRUSHERS.

APPLICATION FILED MAY 23, 1904.

3 SHEETS--SHEET 1.



WITNESSES:
Albert N. Snare
Frank K. Hoover

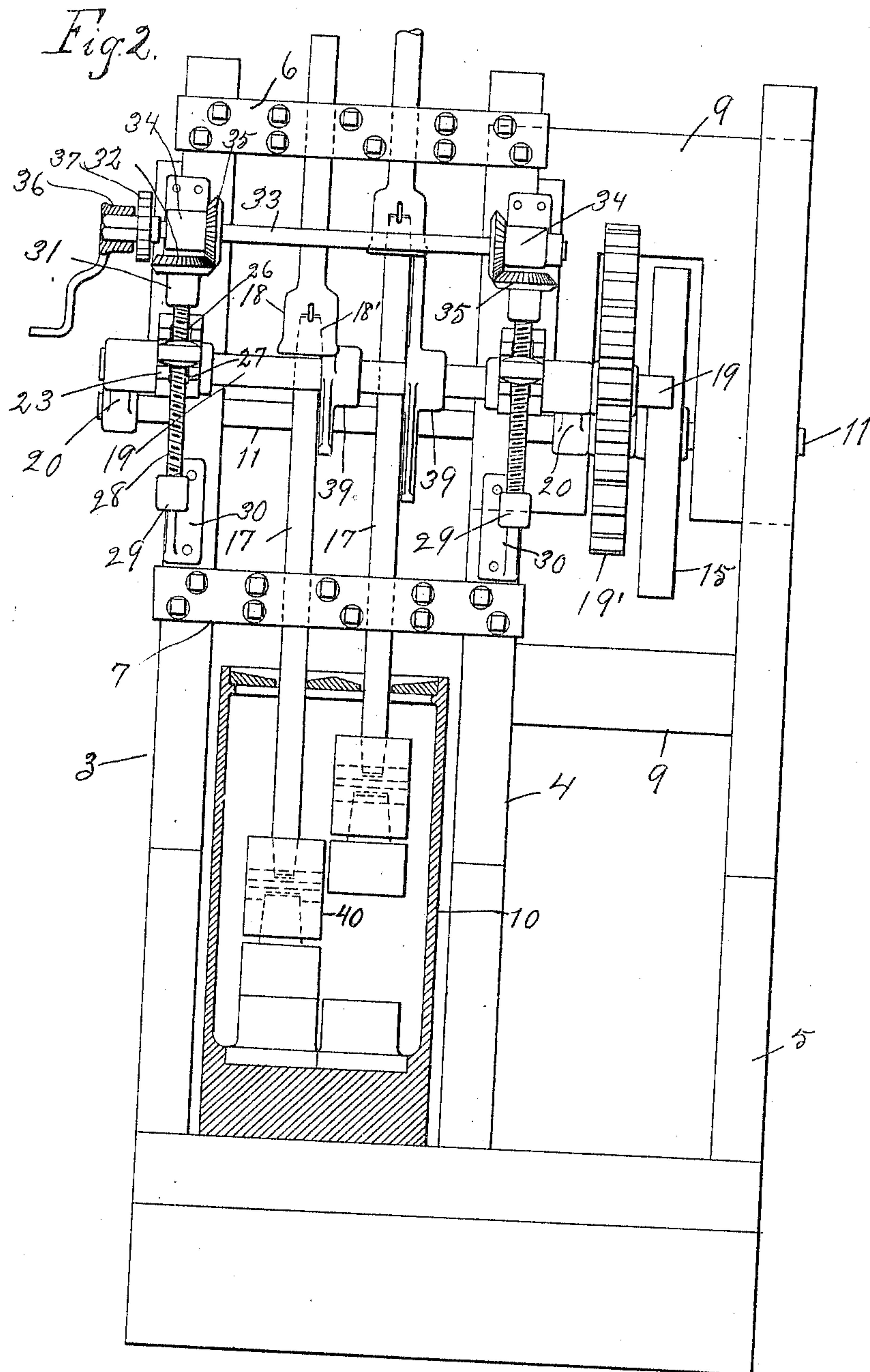
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3 SHEETS—SHEET 2.



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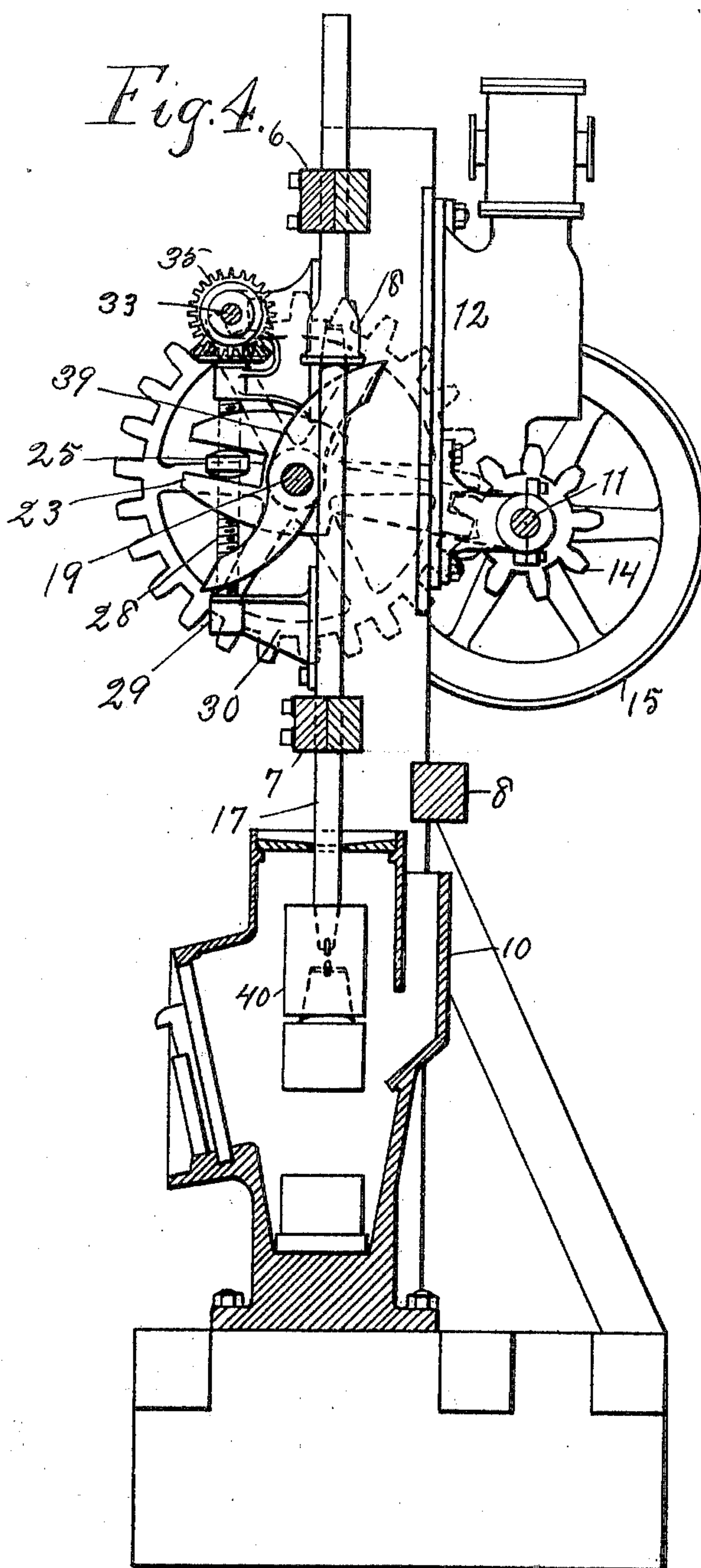
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

WALTER SABIN McKINNEY, OF CHICAGO, ILLINOIS.

STAMP-ACTUATING MECHANISM FOR ORE-CRUSHERS.

No. 811,079.

Specification of Letters Patent.

Patented Jan. 30, 1906.

Application filed May 23, 1904. Serial No. 209,232.

To all whom it may concern:

Be it known that I, WALTER SABIN McKINNEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Stamp-Actuating Mechanisms for Ore-Crushers, of which the following is a specification.

This invention relates to improvements in stamp-actuating mechanisms, and refers more specifically to an improved mechanism for regulating and adjusting the drop of the stamps.

Among the salient objects of the invention are to provide a construction in which the necessity of readjusting the cam or tappet blocks upon the stamp-stems is dispensed with; to provide a construction in which the tappet-blocks retain fixed relation to the cam-stems upon which they are mounted, and means are provided for adjusting the cams relatively thereto as the stamps wear away or are replaced with dies of different thickness; to provide a construction of the character referred to in which the adjustment of the cams may be made in a positive and simple manner and simultaneously as to all of the members pertaining to one group; to provide a construction in which the adjustment of the members does not disturb the driving relations of the driving elements; to provide an improved frame construction which enables the actuating-motor to be mounted directly thereon, if preferred, and in general to provide a simple and improved mechanism of the character referred to.

To the above ends the invention consists of the matters hereinafter described, and more particularly pointed out in the appended claims, and the invention will be readily understood from the following description, reference being had to the accompanying drawings, in which—

Figure 1 is a view principally in side elevation, but with parts in transverse vertical section, of a mechanism embodying my invention. Fig. 2 is a front elevation of the same with one end of the mortar shown in transverse section to expose the stamps. Fig. 3 is a detail perspective view of one of the end-shaft-supporting links. Fig. 4 is a central transverse vertical section of the machine, taken on a plane passing between the stamps and looking toward the engine.

Referring to the drawings, 1 designates as a whole a suitable foundation upon which is mounted a suitable main frame (designated as

a whole 2) and comprising standards 3 4 4', respectively, brace members 5, cross-bars 6, 7, and 8, and a bed-plate 9.

10 designates as a whole the mortar, which is arranged between the standards 3 and 4 and may be of any usual or preferred construction.

11 designates a main driving-shaft suitably mounted upon the upper portion of the frame 2, said shaft forming in the present instance a part of the motor mechanism and being accordingly mounted upon a bed-frame 12 of the engine, which latter is designated as a whole 13. It will be understood, however, that the main shaft may be directly mounted upon the main frame and the motor dispensed with. Upon said main shaft 11 is rigidly mounted a driving-gear 14 and a fly-wheel 15. The main shaft, as best seen in Fig. 2, extends entirely across the width of the main frame and is supported at its end remote from the gear 14 by means of a bearing-bracket 16, mounted upon the stem 3 and indicated in dotted lines in Fig. 1.

17 designates the stamp-stems, of which two are shown in the present instance arranged side by side and mounted to extend through suitable guide-apertures in the cross-bars 6 and 7. Said stems are arranged in a plane parallel with the main shaft 11, but at a considerable distance therefrom and in a plane approximately coincident with the front plane of the main frame. Each stem is provided at a point approximately opposite the main shaft with a tappet-block 18, the tappet-block 18 being formed in the particular instance illustrated as an enlargement on the lower end of the upper section of the stamp-stem, which is of two-part construction. It will be understood, however, that these tappet-blocks may be otherwise formed and mounted.

19 designates as a whole a cam-shaft which is mounted to extend parallel with the main drive-shaft 11 and is supported adjacent to the stamp-stems by means of a pair of adjustable links 20, each journaled at one end upon or concentrically with the main drive-shaft 11. In the preferred embodiment shown the links are journaled directly upon the main shaft at points adjacent to the standards 3 and 4, respectively, and are provided at their swinging or opposite ends with enlarged journal-heads 21, through which the shaft 19 extends. The journal-head of each link is provided at one side with a pair of jaw-like ex-

tensions 22 and 23, respectively, between which is formed an approximately rectangular recess 24, adapted to confine an adjusting-nut 25. (See Fig. 3.) The jaws 22 and 23 are also provided with vertical recesses 26 and 27 in register with each other, and through each extends an adjusting-screw 28, which threads through the adjusting-nut 25. The lower end of each adjusting-screw is seated in a bearing 29, forming part of a bracket 30, while at their upper ends said adjusting-screws extend through journal-bearings 31, mounted upon the upright frame-standards and carry at their ends beveled gears 32. The bevel-gears are keyed upon their respective adjusting-screws and rest at their lower sides directly upon the bearings 31. In order to actuate the adjusting-screws simultaneously and coequally, a cross-shaft 33 is journaled in suitable bearings 34 to extend across the front of the main frame and is provided with miter-gears 35, which engage the respective gears of the adjusting-screws. In the particular instance shown the pairs of miter-gears are arranged in opposed relation, so that the gear force will be counterbalanced, and in order that the adjusting-screws may move the links 20 simultaneously in the same direction with this arrangement, the latter are reversely threaded.

Upon the end of the shaft 33 is suitably mounted a crank-handle 36, and in order that the shaft may be locked in any position of adjustment it is provided with a ratchet-wheel 37, with which is arranged to operate a gravity-pawl 38, mounted upon the adjacent frame-standard, as clearly shown in Fig. 1.

The cam-shaft 19 is provided with the usual cams 39, rigidly mounted thereon adjacent to the respective cam-stems and driven by a gear 19', meshing with gear 14.

In the particular instance illustrated I have shown a compressed-air motor 13 as mounted upon the bed-plate 12, the piston-stem 13' thereof being connected with the main shaft by means of suitable pitman and crank connections.

In the particular stamp-stems illustrated the tappet-block 18, formed as an enlargement upon the lower end of the upper section, is provided with a tapered socket 18', which fits upon the correspondingly-tapered upper end of the lower stamp-stem section. The wedging engagement between these two parts is depended upon to secure them together and enable the lower stamp-stem section and stamp-head thereon to be lifted by the tappet-block 18. The stamp-head as a whole comprises a boss-head 40 and shoe 41. The stamp-head coöperates with the usual die 42, seated in the bottom of the mortar.

The operation of the mechanism constructed as described is probably entirely obvious from the foregoing description; but it may be noted that in adjusting the cam-shaft the supporting-

links which carry the shaft obviously maintain the driving-gear 19' in uniform mesh with the drive-gear 14, regardless of the angular position of adjustment of the links relatively to the main shaft. It will be obvious that as the acting-faces of the shoe and die wear away the tappet-block 18 will gradually descend lower and lower, and this would of course finally carry the tappet-block out of proper relation to the cam were it impossible to adjust the position of the latter.

I claim as my invention—

1. In a stamp-actuating mechanism, the combination of a driving-gear, a cam-shaft, a cam upon said shaft, driving connections between the driving-gear and cam-shaft, and supports adjustably supporting said cam-shaft to move bodily in an arc concentric with the axis of the driving-gear.

2. In a stamp-actuating mechanism, the combination of a driving-gear, a cam-shaft, a gear and cam upon said shaft, said latter gear arranged to mesh with the driving-gear, link-supports adjustably supporting said cam-shaft to move bodily in an arc concentric with the axis of the driving-gear, and a stamp-stem carrying a tappet mounted adjacent to said cam-shaft.

3. In a stamp-actuating mechanism, the combination of a main shaft and driving-gear thereon, a cam-shaft arranged to extend parallel with the main shaft, a gear and cam on said cam-shaft, said latter gear arranged to intermesh with the gear of the main shaft, links pivotally supported concentrically with the main shaft and supporting at their swinging ends the cam-shaft, adjusting devices operatively connected with said links, and a stamp-stem provided with a tappet, arranged to reciprocate adjacent to said cam-shaft.

4. In a stamp-actuating mechanism, the combination of a main shaft and driving-gear thereon, a cam-shaft arranged to extend parallel with the main shaft, a gear and cam on said cam-shaft, said latter gear arranged to intermesh with the gear of the main shaft, links pivotally supported concentrically with the main shaft and supporting at their swinging ends the cam-shaft, vertically-disposed adjusting-screws operatively connected with the ends of the links, and a stamp-stem provided with a tappet, arranged to reciprocate vertically adjacent to said cam-shaft.

5. In a stamp-actuating mechanism, the combination of a main shaft and driving-gear thereon, a cam-shaft arranged to extend parallel with the main shaft, a gear and cam on said cam-shaft, said latter gear arranged to intermesh with the gear of the main shaft, links pivotally supported concentrically with the main shaft and supporting at their swinging ends the cam-shaft, vertically-disposed adjusting-screws operatively connected with the ends of the links, a gear upon each adjusting-screw, a cross-shaft arranged to extend trans-

versely of said adjusting-screws, gears upon said cross-shaft operatively engaging the gears of the respective adjusting-screws, and means for locking said cross-shaft in adjusted position.

6. In a stamp-actuating mechanism, the combination of a suitable main frame comprising three upright standards and a bed-plate connected to and extending between two of said standards, a motor mounted upon said bed-plate, a main drive-shaft operatively connected with the motor, and journaled to extend across the central standard and the standard remote from the bed-plate, a driving-gear upon said main shaft, a pair of links mounted to oscillate upon said main shaft at points adjacent to the intermediate standard and the standard remote from the bed-plate respectively, a cam-shaft journaled in the outer ends of said links

to extend parallel with the main shaft, vertical adjusting-screws supported upon said standards in vertical register with the supporting-links and having screw-threaded engagement with the latter, a miter-gear upon each adjusting-screw, a cross-shaft provided with miter-gears engaging the respective gears of the adjusting-screws, a ratchet-and-pawl mechanism for locking said cross-shaft in adjusted position, a driven gear upon said cam-shaft intermeshing with the gear of the main shaft, a plurality of cams upon said cam-shaft, and a plurality of stamp-stems supported to reciprocate vertically adjacent to the cam-shaft.

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